A STUDY OF MEDICALLY IMPORTANT MOSQUITO VECTORS IN PATHANAMTHITTA DISTRICT OF KERALA, INDIA.

SYNOPSIS

Ever in the epidemiological history of our country mosquito borne diseases have prime importance. Malaria, Filariasis, Dengue Fever, Chikungunya, Yellow Fever, Japanese Encephalitis are notorious among the vector borne diseases. In this context a detailed study of mosquito fauna and their bionomics is very essential to fight against the menace of these diseases.

In the backdrop of vector borne viral diseases, a study was made in a number of randomly selected places in Pathanamthitta district of Kerala state of India in 3 different seasons, namely pre-monsoon, monsoon and post-monsoon in urban and rural settings of low, medium and high terrains to identify the mosquitoes prevalence and their vector potentialities in the district. A total of 25 species of mosquitoes under 5 genera were identified namely *Aedes* (Nos: 4) *Anopheles* (Nos:6), *Armigeres* (No:1), *Culex* (Nos:11) and *Mansonia* (Nos:3). Out of the 25 species, 12 of them are established vectors, 6 of them are suspected vectors and 7 of them are non-vectors.

Pathanamthitta district is a land of unique characteristics, having panoramic stretches of lush paddy fields high land with extensive rubber plantations provide enough habitat to breed mosquitoes profusely. It is a stretch of 2642 sq.kms, Kottayam and Idukki districts boarders on the north, Kollam district on the south, the state of Tamil Nadu on the east, Alappuzha district on the west. It lies between $9^{o}.0'$-$9^{o}30'$ and east longitudes of $76^{o}25'$ - $77^{o}20'$, with a population of 1197412. The ecology and distribution of various mosquitoes species are important in the determination of mosquito vector abundance and related disease prevalence. The criteria for the selection of the district were based on the high incidence of confirmed cases of disease recorded by the health department of Kerala State.

In each terrain the mosquito population is unique due to the peculiarities of the ecosystem. Pathanamthitta is having unique ecosystems that are favourable to the mosquito fauna. Many regions are still not approachable due to lack of proper roads and

communication facilities due to different terrain. Hence the study on the mosquito is very scanty. The present study is the very first study in this district ever known to identify the medically important mosquito vectors in this district. This research work has been done on mosquitoes in Pathanamthitta district as a cross sectional longitudinal multi stage random sampling method conducted over a continuous period of 5 years. Standard techniques for sampling was adopted from WHO (1975). Analysis of the data were done by using software SPSS. Adult and immature larvae were collected from the randomly selected areas of importance. The immature larvae were reared in laboratory to get the adult mosquitoes for proper identification. Mosquitoes were identified using key of Christophers (1933), Barraud (1934) and catalogue of mosquitoes by Knight and Stone (1977).

The major objectives of the study are to know medically important mosquito fauna, their predominance, environmental factors which monitor their population density, bionomics and to suggest appropriate control measures to check their prevalence.

A total of 61,091 mosquitoes were collected, out of which 30,687(50.23%) mosquitoes were from rural areas and 30,404(49.77%) from urban areas during the period of study from February 2007 to January 2012. From 2007 to 2012, 21,028 (34.42%) mosquitoes were collected from lowland, 18,919 (31.96%) from midland and 21,144 (34.61%) from highland. Year-wise collection was 11,899 (19.48%), 126,55 (20.71%), 120,68 (19.75%), 126,90 (20.78%) and 117,79 (19.28%) in 2007-2008, 2008-2009, 2009-2010, 2010-2011 and 2011-2012 respectively from 3 terrains. Habitatwise collection was 4,884 (7.99%) from house premises, 10,761 (17.62%) from plantation, 37,011 (60.58%) from cattle shed and 8,435 (13.81%) from marshy places.

Medically important mosquito vectors identified from the study area were *Ae. aegypti*, *Ae. albopictus, An. culicifacies*, *An. dirus, An. varuna, Cx. pseudovishnui, Cx. quinquefasciatus, Cx. tritaeniorhynchus, Cx. vishnui, Ma. annulifera, Ma. indiana and Ma. uniformis.*

Mosquito species identified as suspected vectors identified were *An. aconitus, An. subpictus, Cx. bitaeniorhynchus, Cx. fuscanus, Cx. gelidus* and *Cx. whitemorei.*

Mosquito species recognized as non-vectors were, *Ae vexans, Ae. vittatus, An. vagus, Ar. subalbatus, Cx. fuscocephala, Cx. sitiens* and *Cx. univittatus.*

The information revealed through this research work would help researchers and the like to proceed further, to know mosquito and control mosquito breeding and hence to fight against the vector borne diseases not only in Pathanamthitta but also in other regions of our country.

This thesis has four chapters. The first chapter is a general introduction in the background of vector borne diseases with special reference to Pathanamthitta district and concluded with a literature review. The second chapter is all about the methodological considerations, adopted in the research work. The design of the study, selection of study sites, standard techniques adopted for collection of mosquitoes etc are included in that part. The third chapter meant for the observation and discussion which explains the major thrust of the study, tries to bring about the medically important mosquito fauna of Pathanamthitta district. Appropriate tables and figures are given in that part. The fourth chapter attempts to suggest measures to control mosquitoes. An attempt is made to highlight various measures used in the past to control mosquitoes through life style oriented practices and agricultural oriented practices which were prevailed in our localities traditionally. Every body's methodical, scientific and integrated approach can help mosquito control.

References used in this thesis are arranged alphabetically in the bibliographical part.

The guidelines of the university are followed in the thesis preparation, title, declaration, certificate, acknowledgment, synopsis, preface, table of contents, list of tables, list of figures, list of abbreviations, content of chapters, bibliography and appendix etc. are arranged in this thesis as per the university guidelines.

Key Words: Medical, vectors, mosquitoes, Pathanamthitta.